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TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE,

TUSKEGEE, ALABAMA,

Experiment Station.

Feeding Acorns.

G. W. CARVER.



TUSKEGEE, ALA.:
Normal School Steam Press.

1898

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—::THE TUSKEGEE::—
 AGRICULTURAL EXPERIMENT STATION.

BULLETIN No. 1. |

| FEB. 1898.

ORGANIZATION AND WORK.

BY THE DIRECTOR.

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 AGRICULTURAL EXPERIMENT STATION.

At the session of the Alabama Legislature of 1896-7, the following bill was passed:

AN ACT.

To establish two Branch Agricultural Experiment Stations for the Colored Race and to make appropriations therefor.

SECTION 1. Be it enacted by the General Assembly of Alabama. That a Branch Agricultural Experiment Station and Agricultural School for the colored race is hereby established and located at Tuskegee, Macon County, Alabama, to be run in connection with the Tuskegee Normal and Industrial Institute, and to be known as the Tuskegee Agricultural Experiment Station and Agricultural School.

SECTION 2. Be it further enacted, That the Board of Control of said Station and School shall be composed of the State Commissioner of Agriculture, the President of the A. & M. College and the Director of the State Experiment Station at Auburn, Alabama, and the members of the Board of Trustees of the Tuskegee Normal and Industrial Institute who reside in the town of Tuskegee, Alabama. The members of said Board shall not receive any compensation, other than expenses actually incurred in visiting the Station and School and while there supervising its affairs.

SECTION 3. Be it further enacted, That for the equipment and improvement of said Station and School, there is hereby appropriated out of the agricultural fund in the treasury, not otherwise appropriated, the sum of fifteen hundred dollars; one-fourth of said sum to be paid quarterly, to-wit: January 1st, April 1st, July 1st and October 1st; to the Treasurer of said Board of Control, who shall give bond in double the amount of the appropriation, for the safe keeping and faithful application of the sum appropriated, the bond to be approved by the Judge of Probate of Macon County, Alabama, and filed in his office, a certified copy of which shall be forwarded to the Commissioner of Agriculture, to be placed on file in his office.

SECTION 4. Be it further enacted, That the Trustees of the said Tuskegee Normal and Industrial Institute shall furnish for the use of said Station and School, all the necessary lands and buildings, and that for such use they shall make no charge against the State of Alabama.

SECTION 5. Be it further enacted, That the Board of Control must cause such experiments to be made at said Station as will advance the interest of scientific agriculture, and to cause such chemical analyses to be made as are deemed necessary, all such analyses, if requested, to be under the supervision of the Commissioner of Agriculture, by the chemist of the agricultural department, without charge.

SECTION 6. Be it further enacted, That said Board of Control may adopt such rules and regulations as they may deem necessary for the purpose of carrying out the provisions of this act, so that the colored race may have an opportunity of acquiring intelligent practical knowledge of agriculture in all its various branches.

SECTION 7. Be it further enacted, That it is the purpose of this act to appropriate to the support of the Experiment Station established by this act; the sums appropriated in this act are appropriated only for the purpose of maintaining and operating Experiment Stations, with the view of educating and training colored students, as herein named, in scientific agriculture.

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Approved February 15th, 1897.

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We dare not attempt to state explicitly what this Station will do or even attempt to do, but we take pleasure in saying that as far as we are able, neither time nor expense will be spared to make our work of direct benefit to every farmer.

But few technical terms will be used, and where such are introduced, an explanation will always accompany them.

With reference to soils, our Station is very happily located, as out of 2,200 acres of land, with such a wide difference as to locality and quality, that nearly or quite all of the leading varieties of soil in the State are represented, which permits our work to be of a much broader scope than it otherwise would.

In a State so extremely varied as to soil and agricultural possibilities as Alabama, many problems of interest present themselves to the Experiment Station worker, but we will endeavor to turn our attention first to the problems that are of the deepest interest to the farmers; orchardist and gardeners.

As far as possible and practicable, soils will be studied with reference to the varieties to be found on the same farm and also in different sections of the State, their special adaptability to certain crops and the special treatment they require as to fertilizers, moisture, conservation, etc. It is also our aim to determine, by careful experiments, to what extent drainage, subsoiling and green manureing are beneficial, and what gains should result from a proper rotation of crops. The testing of peas, clovers, vetches, etc., as soil builders upon different kinds of soil.

Special attention will be given to the kinds and varieties of fruit and vegetables best suited for the home and market.

Our best native and introduced forage plants will receive their share of attention, as they bear directly upon our dairy interests, which, we believe, are not excelled by any of the Southern States in butter and cheese possibilities.

Along the lines of live stock, the rational comparison of breeds, the study of foods in their great and increasing variety, and their relation to the production of milk, fat, wool, bone and muscular tissue; and the effect of climate upon soils, plants and animals, will be studied.

We shall feel glad at any time to come in direct personal communication with the farmers and planters, gardeners and fruit growers of the State, and all others to whom we can be of any service, and all questions within the scope of our Station work will be answered as promptly as possible.

And we not only invite, but urge, every farmer to send samples of soils, grains, fertilizers, fodders, grasses, insects, feeding stuffs, etc. All such samples may be sent by mail or express. We further invite every farmer within reach, to visit our Station frequently and come in more direct touch with us.

We hesitate to make a definite statement as to the quarterly issue of the Bulletins, as the matter under consideration may require them more or less frequent. On an average, we think it safe to say that one will appear every quarter.

Neither do we think it wisdom to give much attention to the analysis of the waters from wells and springs, commercial fertilizers and old feed stuffs, that have been analyzed many times in this country as well as Europe.

The excellent work done in Auburn, Ala., at the Agricultural Experiment Station along these lines are quite sufficient, and we will take pleasure in quoting from them from time to time as the opportunity presents itself.

We will also be glad to quote from other Stations when their work bears directly upon our interests.

As far as possible, Bulletins will be sent free of charge to all who ask for them.

In conclusion, we desire to say that every effort will be put forth to carry out the two-fold object of the Station, viz: That of thoroughly equipping the student along the lines of practical and scientific agriculture; also the solving of many vexing problems that are too complex for the average farmer to work out for himself.

Along all lines our motto shall be to meet the full requirements of the act that made this Station possible.

GEO. W. CARVER,

Director.

NOTE.—The object and aims of our Station are essentially the same as those of nearly or quite all of the other Stations. I have freely used the ideas and, in some cases, without especial reference their language, for which I wish to acknowledge assistance.

G. W. C.

Feeding Acorns. -

G. W. CARVER.

In this beautiful Southland of ours, with so many natural resources, and the repeated failures of the North, East and West to supply the ever-increasing demand for pork, dairy products, etc., has led us to turn much of our attention in this direction.

The great quantity of acorns produced in our oak forests, which have been hitherto practically a waste product, forms the subject of this Bulletin.

I presume that acorns have been used as an article of food ever since their production and that of the animals to eat them, and man has used them in a half-unconscious way, from the time America's first settlers recognized the food value of the wild hog.

It did not take these sturdy colonists long to learn that the meat of the wild hog was fattest and sweetest when the mast (or acorns) were plentiful, as they were then and are now frequently called.

It is not at all strange that so little attention was paid to this food product, as forests were plenty and the supply far in excess of the demand. The people's custom was to turn their hogs out and let them run at large in the fall, and when wanted for meat, all that was necessary was to take the dogs, wagon and gun; recognize the "split," "half-crop" or some such disfigurement of the ear which served as a mark; shoot them down and return home, to repeat the same process when more were wanted. In some sections of the South this system still exists to some extent.

But as the population increased, the forests gave way to cultivated fields, which, of course, decreased the supply of acorns. Yet our soils were rich and the production of other food stuffs comparatively easy, so that the feeding value of this natural product was, in a great measure, lost sight of, and we think it quite time now to consider more closely their value.

I append here the composition of corn and acorns, in order that the reader may compare them. The figures as given are taken from Dr. Armsby's splendid book on feeding, and the figures are essentially those of Julius Kuhn (Mentzel & v. Lengerke's, Landw. Kalender, 1880.)

Before giving these figures, there are a few terms that need explanation before one can make intelligent comparisons. They are as follows:

Total dry matter.—Refers to the weight of any substance dried in the air.

Protein.—By this we mean the class of substances in feeding stuffs that supply the material for the growth of tissue.

Fat and Carbohydrats.—Belonging to that class of substances which produce fat and heat in the animal body.

Crude Fibre.—Meaning the woody part, and is more or less indigestible; foods with much woody fibre possesses a low feeding value.

Ash.—This represents the mineral portion, or what is left after the substance has been burned.

This table represents percentages or the number of pounds in 100 pounds of either substance:

	Total dry Matter.	Protein	Fat.	Nitrogen Free Ext.	Crude Fibre	Ash
Corn	88.9	16.5	4.8	70.2	1.9	1.5
Acorns with shell (Fresh)	49.3	2.2	2.0	34.7	9.4	1.0
Acorns (Dry) without shell	85.6	5.6	4.1	69.2	5.1	1.6
DIFFERENCE IN FAVOR OF CORN.						
First	39.6	8.3	2.8	35.5		
Second	3.3	4.9	.7	1.0		

It takes but a glance at the table to show how favorably acorns compare with corn as a fattening food; yet millions of bushels of this choice food product goes to waste in the United States every year.

The school possesses about 400 head of hogs, which are being grown, fattened and prepared for the table, solely on acorns and kitchen slops.

We purchased about 1,000 bushels this fall, and would have doubled the amount had we not feared their keeping qualities when put in bulk, but experience proves that it is only necessary to keep them cool and dry.

Another interesting experiment is the feeding of acorns to milch cows as a grain ration; in other words, instead of giving them corn, and such large quantities of cotton seed and cotton seed meal, acorns are given.

It is impossible at this writing, to give an accurate, well balanced ration, as the exact feeding value of acorns has, as yet, not been determined. We are feeding the following amount with good results: Two quarts at a feed twice per day, making five pounds.

The results have been very gratifying. While the milk did not materially increase as to quantity, it greatly improved in the amount of butter fat, and as far as I am able to determine at this writing, no bad effects on the butter is produced.

This cow has been fed as above described for one month and sixteen days; the amount of fat gained is also quite noticeable, which leads me to believe that beef may be very profitably produced on this natural food product.

Prof. Radusch, late of Harvard University, has quite an extensive poultry ranch on Greycloud Island, Minnesota, and in an interview with him he makes, substantially, the following statement:

I have tried nearly or quite all of the various poultry foods advertised, and find that acorns, ground up, produce more eggs than anything I have tried; besides keeping the flock healthy.

It is safe to conclude that if fed in too great quantities to laying hens, too much fat would be produced.

The above statement is not at all surprising, if we call certain facts to mind. Many who will read this Bulletin, remember the days of the wild pigeon, when they flew in such great droves as to darken the sun, and remind one of a great moving cloud, indefinite in length, depth and breadth; how they would settle so thickly in their favorite roosting places as to frequently break large limbs several inches in diameter, from the trees upon which they perched.

At this time of the year, which was in the fall, many depended almost wholly on these birds for their supply of meat, and a most excellent dependence it was, as they were easily gotten and the meat of high quality, being so fat that no additional oil was needed in their preparation for the table. Everyone hailed with delight a big crop of acorns, for this meant a great many fat pigeons, and that they would remain a long time.

In feeding acorns there is this precaution necessary; where large quantities are given, plenty of laxative food should be included in the ration, as they are rather binding in their nature and likely to produce harmful results.

Considering the low price of cotton, the high price of corn, the feeding value of acorns and the great quantity produced, the entire South should bend much of their efforts toward saving this valuable natural food. They should be gathered in the fall, put in well ventilated bins, barrels or boxes, and kept as cool as possible to retard the destructive work of the worms and to prevent sprouting. The small varieties are more desirable here than the larger sorts, as they are less liable to sprout in bulk, and are more resistant to worms.

In feeding them to hogs, we find that rather a soft, spongy flesh is produced, with an oily-like lard, that hardens with great difficulty, and frequently not at all. This is readily overcome by feeding corn two or three weeks before butchering, although many hundred pounds of meat go into market, without complaint, that has never been topped off with corn.

A number of persons in this vicinity are feeding them to both cattle and hogs, and in every case report good results.

I know of no wider and more valuable field for experimentation than those of cooking, grinding, steaming, mixing with other foods, digestion experiments, etc.; in short, a thorough test of their feeding value, and it is the aim of this Station to perform as many of these experiments as possible, and would like very much to have the co-operation of other Stations.

We hope the days are not far distant when the destruction of our valuable oak forests will cease, and that many of our scrubby pines will give way and be replaced by this useful tree.

The South has much to hope for in the matter of feeding acorns. As the Hon James Wilson, Secretary of Agriculture, frequently said in addressing our Southern farmers, that the South has the cheapest and best food product in the world, referring to our great output of cotton seed, its by products, with our native and introduced grasses. At present I see no reason why acorns should not be added to the list; in fact, stand at the head in value, alongside of cotton seed meal; the carbohydrates or fat-forming matter coming from the acorns, and the nitrogenous or muscle and milk formers from the cotton seed meal.

The West uses corn largely as the basis of their fat forming foods, as it is produced in such great quantities and so cheaply. The South cannot do this, as the quantity produced is scanty and the cost of production too great; and could it be raised as cheaply as the Western corn, I see no reason why such quantities should be used for fattening purposes, when acorns are so abundant and compare so favorably in fattening value with that of corn, by actual chemical analysis, aside from their dietetic effects, which greatly increases their food value.

The author has spent some time this winter in visiting various acorn districts, and observed the following facts: That wherever acorns were plentiful and the cattle and hogs had access to them, they were the fattest and best. I made a number of inquiries, and learned that these cattle and hogs lived solely on acorns and the pipe-stem cane, (*Arundinaria* Sp.) which remains green all winter, and forms dense patches known as "cane-breaks." Furthermore, I saw the cattle pushing the leaves away with their noses and eating the acorns the same as the hogs.

Horses are very fond of them, and will follow you as quickly for acorns as corn.

In conclusion, we will say that we regret that our knowledge is so meager with reference to experimental data, but as this subject is of such vast importance, not only to Alabama, but to the entire South and, in a measure, to all acorn-growing districts, that we think it wisdom to present it at this time.

